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# Changes in North Carolina's Industrial Roundwood Products output, 1987-1990

Edgar L. Davenport

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## The Author

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**Edgar L. Davenport** is a Resource Technician, Forest Inventory and Analysis, Southeastern Forest Experiment Station, Asheville, NC.

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Southeastern Forest Experiment Station  
P.O. Box 2880  
Asheville, North Carolina 28802

## Foreword

This report presents the findings of a 1990 canvass of all primary wood-using plants in North Carolina and complements Forest Inventory and Analysis' periodic inventory of volume and removals from southeastern timberland. The canvass was made to determine the amount and source of wood receipts and annual timber product drain by county for a specific year. In addition, interstate and cross-regional movement of industrial roundwood are determined. Only primary wood-using mills are canvassed. Primary mills are those that process roundwood in log or bolt form or as chipped roundwood. Examples of industrial roundwood products are saw logs, pulpwood, veneer logs, poles, and logs used for composite panel products (oriented strand board or waferboard) or reconstituted lumber products (parallel strand lumber, laminated veneer lumber, particleboard). Mills producing products from residues generated at primary processors and secondary processors are not canvassed. Trees chipped in the woods are not included in the estimate of timber drain unless delivered to a primary domestic manufacturer.

A 100-percent canvass of all primary wood-processors in North Carolina was conducted in 1991. Out-of-State mills known to be using logs or bolts harvested from North Carolina timberland were also contacted. Each mill was canvassed by mail or through personal contact at plant locations. Telephone contact was made as a followup to mailed questionnaire responses when additional information or clarification of response was necessary. In the event of a nonresponse, receipt data collected in previous surveys were updated based on current data collected for mills of similar size, product type, and location.

Pulpwood production data are taken from an annual canvass of all eastern pulpmills. Medium density fiberboard, insulating board, and hardboard plants are included in this survey. The pulpwood production survey is conducted annually in cooperation with the American Pulpwood Association. Previous surveys for other timber products have been conducted approximately every 3 years since 1964. This Bulletin reports the findings of the 1990 primary wood users canvass and pulpwood production study in North Carolina, and presents changes in product output and residue use since 1987.

These studies are a cooperative project involving the Southeastern Forest Experiment Station and the North Carolina Department of Environment, Health, and Natural Resources, Division of Forest Resources. The Southeastern Station gratefully acknowledges the cooperation and assistance provided by the North Carolina Division of Forest Resources in collecting mill data. Appreciation is also expressed to forest industry and mill managers for providing timber products information. The information presented in this report is based on responses from over 99 percent of mills operating in 1990. These mills accounted for nearly 100 percent of the 1990 mill receipts. Eight pulpmills, 32 veneer mills, 13 mills manufacturing other industrial products, 5 composite panel mills, and 305 of the 308 sawmills in operation in 1990 provided current mill data.



## **Output of Industrial Roundwood Products**

Output of industrial roundwood products in 1990 was over 764 million cubic feet, up by 2 percent or 17 million cubic feet from 1987 (table 1). Output of softwood roundwood products increased 4 percent to over 491 million cubic feet, while that of hardwood roundwood products decreased slightly to nearly 273 million cubic feet. Softwood roundwood products accounted for 64 percent of the State's total output of roundwood timber products, 1 percent more than in 1987.

Pulpwood and saw logs were the principal roundwood products in 1990. Combined output of these two products totaled more than 657 million cubic feet, and accounted for 86 percent of the State's total roundwood output.

### **saw Logs**

Saw-log production dropped 1 percent between 1987 and 1990 to nearly 327 million cubic feet. Still, output of saw logs accounts for nearly 43 percent of the State's total roundwood products output in 1990 (table 1). Output of hardwood saw logs decreased by more than 10 percent to 103 million cubic feet, while that of softwood saw logs increased nearly 4 percent to 223 million cubic feet. Softwood species accounts for 68 percent of the State's saw-log production, 3 percent more than in 1987.

### **Veneer Logs**

Since 1987, hardwood veneer output from roundwood increased to 26 million cubic feet, or by 34 percent, while softwood veneer production decreased by 10 percent to 44 million cubic feet (table 1). Softwoods still account for nearly 63 percent of the veneer production. Veneer accounted for 9 percent of the State's output of roundwood timber products, about the same as in 1987.

### **Pulpwood**

Output of roundwood pulpwood increased 3 percent to nearly 331 million cubic feet in 1990 (table 1). Both softwood and hardwood output, increased, but

softwood output increased most-nearly 5 percent to almost 204 million cubic feet, nearly 62 percent of pulpwood production. Total pulpwood output accounted for 43 percent of the State's total output of roundwood timber products, about the same as in 1987.

### **Composite Panels**

Several composite panel mills have come on line in the Southeast in recent years and have utilized a growing proportion of the roundwood timber volume. Prior to 1990, roundwood utilized in composite panels was reported in our publications as other industrial. In 1990, almost 35 million cubic feet of roundwood was used in composite panels, almost 5 percent of the State's total output of roundwood timber products (table 1). About 53 percent was softwood and 47 percent hardwood.

### **Other Industrial**

Other industrial products include poles, posts, mulch, excelsior, log homes, charcoal, and other reconstituted wood products. In 1990, combined output of roundwood used for these products totaled 2 million cubic feet (table 1). Valid comparisons in output of these products in 1987 and 1990 are not possible because the volume of composite panels was included in the other industrial products category prior to 1990. However, if the volume of composite panels was added in 1990, other industrial would probably show an increase instead of the decline shown in table 1.

### **Number of Mills and Receipts**

The number of sawmills operating in North Carolina decreased from 362 in 1987 to 308 in 1990 (table 2). Over the same period, receipts of saw logs dropped by 5 percent to 327 million cubic feet (table 3). Hardwood receipts accounted for the largest decline—13 percent—and totaled 107 million cubic feet. Yellow pine accounted for 64 percent of the total saw-log receipts (table 4). Hard hardwoods made up the next largest proportion, 20 percent of the receipts.

Since 1987, another veneer mill began production in North Carolina, bringing the total to 32 (table 2). Receipts of veneer logs totaled 79 million cubic feet and exceeded production by nearly 13 percent, or 9 million cubic feet. Receipts of hardwood increased almost 27 percent to nearly 32 million cubic feet, while those of softwood dropped nearly 11 percent (table 3). Still, softwood accounted for nearly 60 percent of the State's total veneer-log receipts. Yellow pines are still the species used most in the manufacturing of veneer (table 4). In 1990, nearly 60 percent of the 79 million cubic feet used was yellow pine. Soft hardwoods (mostly gum and poplar) accounted for nearly 36 percent, or 28 million cubic feet, of the State's total receipts.

There were eight pulpmills operating within the State during the period (table 2). Total receipt's at these pulpmills increased well over 6 percent. to 311 million cubic feet (table 3). Softwood pulpwood accounted for the largest proportion of the increase.

In 1990, the State had five composite panel mills with total receipts of nearly 29 million cubic feet, (tables 2 and 3). Almost 16 million cubic feet of southern yellow pine, and well over 10 million cubic feet of soft hardwoods, mostly sweetgum, were used in the manufacture of composite panels (table 4).

In 1990, the State had 13 other industrial mills. These had receipts in excess of 2 million cubic feet, (tables 2 and 3). Southern yellow pine accounted for 98 percent of the volume used by these mills (table 4).

## Roundwood Movement

North Carolina is a net exporter of industrial roundwood. In 1990, production of roundwood from North Carolina timberlands totaled over 764 million cubic feet, about 87 percent of which was retained for processing by mills within the State (table 5). Exports of roundwood to mills outside North Carolina totaled over 103 million cubic feet,, an increase of nearly 5 percent since 1987. Imports from other States amounted to 87 million cubic feet, a decrease of 1 percent since 1987. Exports exceeded imports by 10 million cubic feet in 1987 and by nearly 16 million cubic feet in 1990. The volume of trees chipped in

the woods and delivered to chip facilities for export overseas is not included in the estimate of roundwood harvested or exported. Forest Inventory and Analysis does not have the means to monitor this volume or to differentiate at export facilities between the volume of chips generated at chip facilities and the volume processed in the woods. Japan is very active in capacity expansion and has increased demand for hardwood chips used in high-grade specialty papers. The volume of hardwood chips exported from the Southern United States has grown in recent years, from 25,000 tons in 1987 to more than 1 million tons in 1990. Japanese, Korean, and Taiwanese wood-fiber companies are the primary purchasers.<sup>1</sup>

The State exported 6 percent of its saw-log production, nearly 20 million cubic feet, to mills in South Carolina and Virginia, (tables 6 and 7). In return, mills in North Carolina imported 6 percent, or 20 million cubic feet, of their receipts from Georgia, South Carolina, Tennessee, and Virginia.

North Carolina is a net importer of veneer logs. In 1990, almost 11 million cubic feet of veneer logs were imported from Georgia, South Carolina, and Virginia. Other imports came from nine additional Eastern States as far north as Maine. More than 3 million cubic feet of veneer logs were exported to South Carolina and Virginia (tables 6 and 8).

Imports of roundwood for composite panel products account for well over 2 million cubic feet, or 9 percent, of receipts (table 6). Imports to composite panel mills in North Carolina came from Virginia and Tennessee with the bulk, over 2 million cubic feet, coming from Virginia (table 9). The State is a net exporter of roundwood used for composite panels. In 1990, 8 million cubic feet, or 23 percent, of production, was exported to mills in Virginia. Hardwood made up 58 percent of export volume. Production exceeded receipts by 19 percent, or nearly 6 million cubic feet.

The State was a net exporter of roundwood pulpwood in 1990 (table 6). Production exceeded receipts by nearly 20 million cubic feet, or 6 percent. Total exports amounted to nearly 72 million cubic feet, or 22 percent of the production. Nearly 31 million cubic feet of softwood pulpwood was exported to South

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<sup>1</sup>Colquitt, John. 1991. APA Technical Release 91-R-65. August.

Carolina. Other State's receiving North Carolina's pulpwood were Tennessee and Virginia, with Virginia receiving over 26 million cubic feet of hardwood roundwood pulpwood. Imports totaled 52 million cubic feet and accounted for nearly 17 percent of the pulpwood mill receipts. Fifty-four percent, or 28 million cubic feet, of these pulpwood imports came from South Carolina (table 10). Almost 12 million cubic feet, or 23 percent, came from Virginia, and the remainder was imported from Tennessee, Georgia, Kentucky, and West Virginia.

The State exported 7 percent, or 154 thousand cubic feet of roundwood used for other industrial products to mills in Virginia (tables 6 and 11). Mills in North Carolina, in return, imported about 6 percent, or 121 thousand cubic feet, of their receipts from South Carolina.

## **Plant Byproducts**

Mill residues from saw logs totaled 213 million cubic feet in 1990 (table 12) and accounted for 72 percent of the 295 million cubic feet of residues produced. Most of the 102 million cubic feet of coarse residues from saw logs were used in fiber products (table 13), while most of the bark and sawdust was used for industrial fuel. In 1990, most of the shavings from lumber were used for other miscellaneous products (bedding, landscaping, and other uses). In 1987, more of the shavings were used for the manufacture of particleboard. Less than 2 percent of the saw-log residues went unused in 1990.

Mill residues of all types generated from veneer logs amounted to over 41 million cubic feet in 1990 (table 12) and accounted for 14 percent of the total residues produced. Nearly 43 percent of the 26 million cubic feet of coarse residues were cores from veneer lathes sawn into landscape timbers and framing studs (table 13). The slabs from these cores and other coarse residues were chipped for use in fiber products. Most of the nearly 16 million cubic feet of sawdust and bark was used for industrial fuel. Less than 1 percent of the veneer residues went unused.

Over 34 million cubic feet of bark was extracted from roundwood pulpwood in 1990 (table 12). Most of this bark was used as industrial fuel. Less than 1 percent went unused.

For composite panel products, only bark is reported as residue because the entire main stem (minus the bark) is chipped and utilized. In 1990, bark residue from panel manufacturing totaled well over 2 million cubic feet and accounted for 3 percent of the bark from all products (table 12). Most of this bark was used for industrial fuel. Very little went unused. Residues of all types generated by other industrial mills totaled nearly 4 million cubic feet (table 12). Bark accounted for 83 percent of the residues generated. These residues were used primarily for industrial fuel.

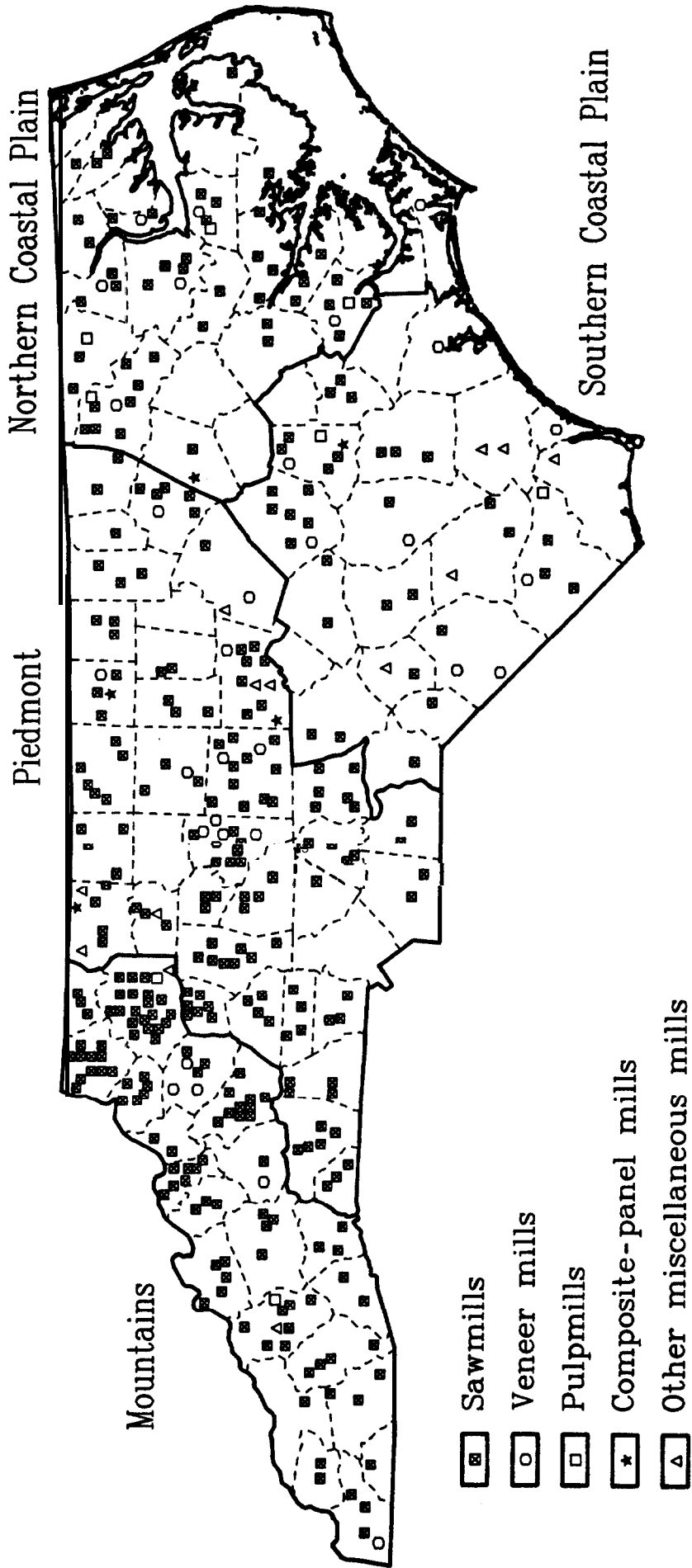
## **Regional Trends**

Output of industrial roundwood products increased between 1987 and 1990 in the Northern Coastal Plain, Piedmont, and Mountain regions, but declined in the Southern Coastal Plain region (fig. 1). Hardwood output declined in the Southern Coastal Plain and Mountain regions. Softwood accounted for 60 percent or more of industrial roundwood products in all regions except the Mountain region, where hardwood accounted for 58 percent of the total output. Changes in output by product varied by region.

### **Southern Coastal Plain**

Output of pulpwood declined by 11 percent, or nearly 13 million cubic feet, in the 21-county Southern Coastal Plain region between 1987 and 1990. Volume of hardwood pulpwood declined by 14 percent, or 6 million cubic feet (table 14). Softwood pulpwood accounted for over 30 percent of total output, of all timber products in 1987 but for only 29 percent in 1990. Total pulpwood production accounted for 104 million cubic feet, or 46 percent, of the region's total output of all industrial roundwood products in 1990, 4 percent less than in 1987. Production of saw logs rose almost 3 percent to nearly 78 million cubic feet in spite of the 21-percent decrease in production of hardwood saw logs. Output of hardwood saw logs dropped well over 3 million cubic feet, while that of softwood saw logs increased nearly 9 percent to nearly 65 million cubic feet. Total output of saw logs accounted for 34 percent of the region's total output of industrial roundwood products. The Southern Coastal Plain region produced 34 million cubic feet of veneer logs, 49 percent of the State's total. Hardwood

Note: of mills within counties are not shown accurately.





veneer output increased 67 percent, well over 3 million cubic feet, while softwood output declined by nearly 11 percent. In 1990, the Southern Coastal Plain region had 2 pulpmills, 32 sawmills, 9 veneer mills, 1 composite panel mill, and 5 other miscellaneous mills. These mills produced 225 million cubic feet of roundwood products. This production was 29 percent of the State's total. Only the Northern Coastal Plain produced more.

### **Northern Coastal Plain**

The 23-county Northern Coastal Plain produces more pulpwood than does any other region of North Carolina. The production of pulpwood increased here by 6 percent, to 132 million cubic feet, 40 percent of the State's total pulpwood output (table 15). Output of both softwood and hardwood pulpwood increased. Softwoods accounted for 62 percent of 1990 production. Pulpwood accounted for nearly 52 percent of the region's total output of roundwood products. Output of saw logs increased by 7 percent and totaled nearly 93 million cubic feet. The Northern Coastal Plain ranks second to the Piedmont in output of saw logs, producing 28 percent of the total for the State. Since 1987, output of softwood saw logs increased by 11 percent to nearly 74 million cubic feet and accounted for 79 percent of the regional total. Output of hardwood saw logs dropped by 5 percent to 19 million cubic feet. The Northern Coastal Plain is second to the Southern Coastal Plain in output of veneer. The region produced 32 percent of the State's veneer output in 1990. The output of hardwood veneer increased 10 percent to nearly 8 million cubic feet, while that of softwood veneer decreased by 9 percent. Softwood species still accounted for 66 percent of the region's veneer output. In 1990, the Northern Coastal Plain region had 4 pulpmills, 45 sawmills, 6 veneer mills, and 1 composite panel mill. These mills produced 256 million cubic feet of roundwood products. The Northern Coastal Plain region produced nearly 34 percent of the State's total output of industrial roundwood products, more than any other survey unit.

### **Piedmont**

The 35-county Piedmont region produces more roundwood for saw logs than any other region in the State. Production of both hardwood and softwood saw logs dropped in 1990, but still amounted to

nearly 113 million cubic feet, or 34 percent of the statewide total (table 16). Saw logs made up nearly 58 percent of the region's total output of industrial roundwood products. Softwoods made up 63 percent of production of saw logs in 1987 and again in 1990. Pulpwood production increased almost 7 percent to nearly 56 million cubic feet in 1990. Production of both softwood and hardwood pulpwood increased, but softwoods still account for 61 percent of the pulpwood output. Pulpwood output in the Piedmont region accounted for only 17 percent of the State's total pulpwood production. Veneer-log output increased 17 percent to more than 9 million cubic feet, about 5 percent of the region's total output. Output of hardwood veneer increased 40 percent since 1987, while that of softwood veneer declined. In 1990, the Piedmont region had 130 sawmills, 12 veneer mills, 6 other miscellaneous mills, and 3 composite panel mills. These mills produced well over 195 million cubic feet of industrial roundwood products. The Piedmont accounted for nearly 26 percent of the State's total output of industrial roundwood products.

### **Mountains**

The output of pulpwood and veneer increased in the 21-county Mountain region, while that of saw logs decreased (table 17). Output of both softwood and hardwood saw logs was down in 1990. Total output of saw logs was down by 17 percent to nearly 44 million cubic feet, but still amounted to nearly 50 percent of the region's total output of roundwood products. Hardwoods accounted for 69 percent of the region's output of saw logs in 1990. Pulpwood output was well over 38 million cubic feet in 1990, almost 44 percent more than in 1987. Softwood pulpwood output increased nearly 92 percent and accounted for nearly 57 percent of the pulpwood production in the region. Output of veneer logs increased nearly 36 percent to almost 4 million cubic feet in 1990. Output of hardwood veneer increased nearly 25 percent and accounted for 92 percent of the region's veneer output. In 1990, the Mountain region had 101 sawmills, 5 veneer mills, 2 pulpmills, and 2 other miscellaneous mills, and these mills produced nearly 88 million cubic feet of roundwood products. The Mountain region accounted for nearly 12 percent of the State's total output of roundwood products.

## Definitions of Terms

**Composite panels.** Consists of structural panels (oriented strand board or waferboard), particleboard (industrial underlayment, thin panelboard), and fiberboard (medium-density fiberboard, insulation board).

**Consumption.** The quantity of a commodity, such as pulpwood, utilized.

**Drain.** The volume of roundwood removed from any geographic area where timber is grown.

**Exports.** The volume of roundwood utilized by mills outside the geographic area where timber was cut.

**Industrial roundwood products.** Any primary use of the main stem of a tree, such as saw logs, poles, pilings, veneer logs, pulpwood, posts, or cooperage logs.

**Industrial timber products.** All timber products manufactured from either roundwood or plant byproducts, except firewood.

**Imports.** The volume of roundwood delivered to a mill or group of mills in a specific geographic area but harvested from outside that particular area.

**Plant residues.** Wood material generated in the production of timber products at primary manufacturing plants.

Suitable for chipping such as slabs, edgings, trim, veneer cores, and ends.

**Fine residues.** Not suitable for chipping such as sawdust, shavings, and veneer clippings.

**Primary wood-using plants.** Industries that receive roundwood or chips from roundwood for the manufacture of products such as veneer, pulp, and lumber.

**Receipts.** The quantity or volume of industrial roundwood received at a mill or by a group of mills in a geographic area, regardless of the geographic source. Volume of roundwood receipts is equal to the volume of roundwood retained in a geographic location plus roundwood imported from other locations.

**Roundwood.** Logs, bolts, or other round sections cut from trees for industrial manufacture or consumer use.

**Roundwood chipped.** Any timber cut primarily for industrial manufacture, delivered to non-pulpmills, chipped, and then sold to pulpmills for use as fiber. Includes tops, jump sections, and whole trees.

**Roundwood product drain.** That portion of total drain used for a product.

**Saw log.** A log meeting minimum standards of diameter, length, and defect, including logs at least 8 feet long, sound and straight, and with a minimum diameter inside bark of 6 inches for softwoods and 8 inches for hardwoods.

**Timber products output.** Roundwood production in an area's forests (equals roundwood product drain).

**Timber removals.** The merchantable volume of trees removed from the timberland inventory by harvesting, cultural operations such as stand improvement, land clearing, or changes in land use.

**Veneer log.** Logs to be used in the production of plywood, finished panels, or veneer sheets, both rotary cut and sliced.

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**Conversion Factor<sup>a</sup>**

**Saw logs**

Softwood	0.17095 cubic foot = 1 board foot 5.85 board feet = 1 cubic foot
Hardwood	0.16890 cubic foot = 1 board foot 5.92 board feet = 1 cubic foot

**Veneer logs**

Softwood	0.16591 cubic foot = 1 board foot 6.03 board feet = 1 cubic foot
Hardwood	0.16547 cubic foot = 1 board foot 6.04 board feet = 1 cubic foot

**Composite panels**

Softwood	0.17095 cubic feet = 1 board foot 5.85 board feet = 1 cubic foot
Hardwood	0.16890 cubic feet = 1 board foot 5.92 board feet = 1 cubic foot

**Pulpwood<sup>b</sup>**

Softwood	76.7 cubic feet/cord
Hardwood	76.4 cubic feet/cord

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<sup>a</sup>Conversion factors vary with stem size (d.b.h.) and species. The factors shown are for trees of average diameters removed in North Carolina during the latest survey period.

<sup>b</sup>Cubic feet of solid wood per cord.

## Tables

Table 1--Roundwood timber products output, by product and species group, North Carolina, 1987 and 1990

Product and species group	Year		Change
	1987	1990	
	Thousand cubic feet		Percent
<b>Saw logs</b>			
Softwood	215,719	223,254	+3.5
Hardwood	115,382	103,440	-10.3
Total	331,101	326,694	-1.3
<b>Veneer logs</b>			
Softwood	48,892	44,100	-9.8
Hardwood	19,402	26,038	+34.2
Total	68,294	70,138	+2.7
<b>Pulpwood<sup>a</sup></b>			
Softwood	194,421	203,651	+4.7
Hardwood	126,115	127,084	+0.8
Total	320,536	330,735	+3.2
<b>Composite panels<sup>b</sup></b>			
Softwood	NA	18,159	NA
Hardwood	NA	16,362	NA
Total	NA	34,521	NA
<b>Other industrial</b>			
Softwood	13,456	2,047	-84.8
Hardwood	13,728	37	-99.7
Total	27,184	2,084	-92.3
<b>All industrial</b>			
softwood	472,488	491,211	+4.0
Hardwood	274,627	272,961	-.6
Total	747,115	764,172	+2.3

NA = Not applicable.

<sup>a</sup>Includes roundwood that was delivered to non-pulpmills and then chipped and sold to pulpmills (22,683,000 cubic feet in 1987 and 11,760,000 cubic feet in 1990).

<sup>b</sup>Volume included with other industrial prior to 1990.

Table 2--Number of primary wood-using plants, by industry,  
North Carolina, 1987 and 1990

Industry	Year		Change
	1987	1990	
	<u>Number</u>		<u>Percent</u>
Sawmills	362	308	-14.9
Veneer mills	31	32	<b>+3.2</b>
Pulpmills	8	8	0
Composite-panel mills <sup>a</sup>	NA	5	NA
Other	21	13	-38.1
All plants	422	366	-13.3

NA = Not applicable.

<sup>a</sup>Mills included with other prior to 1990.

Table 3--**Roundwood** receipts, by product and species group,  
North Carolina, 1987 and 1990

Product and species group	Year		Change
	1987	1990	
	<u>Thousand cubic feet</u>		<u>Percent</u>
<b>Saw logs</b>			
Softwood	221,853	219,862	-0.9
Hardwood	123,101	107,206	-12.9
Total	344,954	327,068	-5.2
<b>Veneer logs</b>			
Softwood	53,090	47,406	-10.7
Hardwood	24,950	31,654	+26.9
Total	78,040	79,060	+1.3
<b>Pulpwood<sup>a</sup></b>			
Softwood	183,529	203,630	+11.0
Hardwood	108,598	107,469	-1.0
Total	292,127	311,099	+6.5
<b>Composite panels<sup>b</sup></b>			
Softwood	NA	15,926	NA
Hardwood	NA	13,017	NA
Total	NA	28,943	NA
<b>Other industrial</b>			
Softwood	10,594	2,014	-81.0
Hardwood	11,377	37	-99.7
Total	21,971	2,051	-90.7
<b>All industrial</b>			
Softwood	469,066	488,838	+4.2
Hardwood	268,026	259,383	-3.2
Total	737,092	748,221	+1.5

NA = Not applicable.

<sup>a</sup> Includes roundwood that was delivered to non-pulpmills and then chipped and sold to pulpmills (25,406,000 cubic feet in 1987 and 12,949,000 cubic feet in 1990).

<sup>b</sup> Volume included with other industrial prior to 1990.

Table 4--Roundwood receipts by species and type of mill, North Carolina, 1990

Species	Type of mill					
	All mills	Sawmills	Veneer mills	OSB and panels	Pulpmills <sup>a</sup>	Other mills
	<u>Thousand cubic feet</u>					
Softwood						
Yellow pine	274,573	209,527	47,228	15,804	NA	2,014
Other softwood	10,635	10,335	178	122	NA	0
Unclassified	203,630	0	0	0	203,630	0
Total softwoods	488,838	219,862	47,406	15,926	203,630	2,014
Hardwood						
Soft hardwoods	78,995	40,425	28,116	10,454	NA	0
Hard hardwoods	72,919	66,781	3,538	2,563	NA	37
Unclassified	107,469	0	0	0	107,469	0
Total hardwoods	259,383	107,206	31,654	13,017	107,469	37
All species	748,221	327,068	79,060	28,943	311,099	2,051

NA = Not applicable.

<sup>a</sup>Only collected by softwood and hardwood and includes roundwood chipped.

Table S--Industrial roundwood movement, by year and species group, North Carolina, 1987 and 1990

Year	Production	Exports	Retained	Imports	Receipts
<u>Thousand cubic feet</u>					
SOFTWOOD					
1987	472,488	61,359	411,129	57,937	469,066
1990	491,211	61,249	429,962	58,876	488,838
HARDWOOD					
1987	274,627	36,872	237,755	30,271	268,026
1990	272,961	41,825	231,136	28,247	259,383
ALL SPECIES					
1987	747,115	98,231	648,884	88,208	737,092
1990	764,172	103,074	661,098	87,123	748,221



Table 6--Industrial roundwood movement by product and species group, North Carolina, 1990

Product and species group	Production	Exports	Retained	Imports	Receipts
	<u>Thousand cubic feet</u>				
Saw logs					
Softwood	<b>223,254</b>	<b>15,705</b>	<b>207,549</b>	<b>12,313</b>	<b>219,862</b>
Hardwood	<b>103,440</b>	<b>4,077</b>	<b>99,363</b>	<b>7,843</b>	<b>107,206</b>
<b>Total</b>	326,694	<b>19,782</b>	<b>306,912</b>	<b>20,156</b>	<b>327,068</b>
Veneer logs					
Softwood	<b>44,100</b>	<b>2,882</b>	<b>41,218</b>	<b>6,188</b>	<b>47,406</b>
Hardwood	<b>26,038</b>	<b>549</b>	<b>25,489</b>	<b>6,165</b>	<b>31,654</b>
<b>Total</b>	<b>70,138</b>	<b>3,431</b>	<b>66,707</b>	<b>12,353</b>	<b>79,060</b>
Pulpwood <sup>a</sup>					
Softwood	<b>203,651</b>	<b>39,105</b>	<b>164,546</b>	<b>39,084</b>	<b>203,630</b>
Hardwood	<b>127,084</b>	<b>32,526</b>	<b>94,558</b>	<b>12,911</b>	<b>107,469</b>
<b>Total</b>	<b>330,735</b>	<b>71,631</b>	<b>259,104</b>	<b>51,995</b>	<b>311,099</b>
Composite panels					
Softwood	<b>18,159</b>	<b>3,403</b>	<b>14,756</b>	<b>1,170</b>	<b>15,926</b>
Hardwood	<b>16,362</b>	<b>4,673</b>	<b>11,689</b>	<b>1,328</b>	<b>13,017</b>
<b>Total</b>	<b>34,521</b>	<b>8,076</b>	<b>26,445</b>	<b>2,498</b>	<b>28,943</b>
Other industrial					
Softwood	<b>2,047</b>	<b>154</b>	<b>1,893</b>	<b>121</b>	<b>2,014</b>
Hardwood	<b>37</b>	<b>0</b>	<b>37</b>	<b>0</b>	<b>37</b>
<b>Total</b>	<b>2,084</b>	<b>154</b>	<b>1,930</b>	<b>121</b>	<b>2,051</b>
All products					
Softwood	<b>491,221</b>	<b>61,249</b>	<b>429,962</b>	<b>58,876</b>	<b>488,838</b>
Hardwood	<b>272,961</b>	<b>41,825</b>	<b>231,136</b>	<b>28,247</b>	<b>259,383</b>
<b>Total</b>	<b>764,172</b>	<b>103,074</b>	<b>661,098</b>	<b>87,123</b>	<b>748,221</b>

<sup>a</sup>Includes roundwood chipped.

Table 7--Saw log volume by destination, source, and species group,  
North Carolina, 1990

Destination and source	Species group		
	All species	Softwood	Hardwood
	Thousand cubic feet		
North Carolina (retained)	306,912	207,549	99,363
Exports to:			
South Carolina	<b>9,232</b>	7,820	1,412
Virginia	10,550	7,885	2,665
Imports from:			
Georgia	851	212	639
South Carolina	6,755	5,216	1,539
Tennessee	909	128	781
Virginia	11,641	6,757	4,884

Table 8--Veneer volume by destination, source, and species group,  
North Carolina, 1990

Destination and source	Species group		
	All species	Softwood	Hardwood
	Thousand cubic feet		
North Carolina (retained)	66,707	41,218	25,489
Exports to:			
South Carolina	357	102	255
Virginia	3,074	2,780	294
Imports from:			
Georgia	109	0	109
Kentucky	72	0	72
Maine	23	0	23
Maryland	296	0	296
New York	23	0	23
Ohio	11	0	11
Pennsylvania	95	0	95
South Carolina	7,030	6,125	905
Tennessee	916	0	916
Vermont	23	0	23
Virginia	3,475	63	3,412
West Virginia	280	0	280

Table 9--Composite panel volume by destination, source, and species group, North Carolina, 1990

Destination and source	Species group		
	All species	Softwood	Hardwood
<u>Thousand cubic feet</u>			
North Carolina (retained)	26,445	14,756	11,689
Exports to:			
Virginia	8,076	3,403	4,673
Imports from:			
Tennessee	101	101	0
Virginia	2,397	1,069	1,328

Table 10--Pulpwood<sup>a</sup> volume by destination, source, and species group, North Carolina, 1990

Destination and source	Species group		
	All species	Softwood	Hardwood
<u>Thousand cubic feet</u>			
North Carolina (retained)	259,104	164,546	94,558
Exports to:			
South Carolina	37,026	30,853	6,173
Tennessee	1,819	1,819	0
Virginia	32,786	6,433	26,353
Imports from:			
Georgia	7,627	5,431	2,196
Kentucky	9	0	9
South Carolina	28,009	22,408	5,601
Tennessee	4,537	1,434	3,103
Virginia	11,804	9,811	1,993
West Virginia	9	0	9

<sup>a</sup>Includes roundwood chipped.

Table 11--Other **industrial**<sup>a</sup> volume by destination, source, and species group, North Carolina, 1990

Destination and source	Species group		
	All species	Softwood	Hardwood
	<u>Thousand cubic feet</u>		
North Carolina (retained)	1,930	1,893	37
Exports to:			
Virginia	154	154	0
Imports from:			
South Carolina	121	121	0

<sup>a</sup>**Includes** poles, posts, mulch, firewood, log homes, charcoal, and all other industrial mills.

Table 12--Primary mill residue volume by roundwood type, species group, and residue type, North Carolina, 1990

Roundwood type and species group	Residue type				
	All types	Bark	Coarse	Sawdust	Shavings
	<u>Thousand cubic feet</u>				
Saw logs					
Softwood	147,720	16,447	69,491	43,498	18,284
Hardwood	65,535	10,911	32,036	21,528	1,060
Total	213,255	27,358	101,527	65,026	19,344
Veneer logs					
Softwood	28,537	3,623	18,912	6,002	0
Hardwood	12,821	3,264	6,861	2,696	0
Total	41,358	<b>6,887</b>	25,773	8,698	<b>0</b>
Pulpwood					
Softwood	21,042	21,042	0	0	0
Hardwood	13,292	13,292	0	0	0
Total	34,334	34,334	0	0	0
Composite panels					
Softwood	1,190	1,190	0	0	0
Hardwood	1,321	1,321	0	0	0
Total	2,511	2,511	0	0	0
Other <b>industrial</b> <sup>a</sup>					
Softwood	3,821	3,172	649	0	0
Hardwood	21	5	11	5	0
Total	3,842	3,177	660	5	0
Total					
Softwood	202,310	45,474	89,052	49,500	18,284
Hardwood	92,990	28,793	38,908	24,229	1,060
Total	295,300	74,267	127,960	73,729	19,344

<sup>a</sup>Includes poles, pilings, posts, and other industrial products.

Table 13--**Disposal** of residue at primary wood-using plants, by product, species group, and type of residue, North Carolina, 1987 and 1990

Product and species group	All types		Bark		Coarse		Sawdust		Shavings	
	1987	1990	1987	1990	1987	1990	1987	1990	1987	1990
					Thousand	cubic feet				
Fiber products										
Softwood	83,554	72,509	0	0	78,170	72,484	2,141	25	3,243	0
Hardwood	28,909	24,954	13	0	28,601	24,890	158	64	137	0
Total	112,463	97,463	13	0	106,771	97,374	2,299	89	3,380	0
Particleboard										
Softwood	12,027	10,114	0	0	4,583	1,175	1,988	5,078	5,456	3,861
Hardwood	8,124	4,719	23	0	6,967	3,106	1,025	1,304	109	309
Total	20,151	14,833	23	0	11,550	4,281	3,013	6,382	5,565	4,170
Strand or wafer board <sup>a</sup>										
Softwood	NA	582	NA	0	NA	582	NA	0	NA	0
Hardwood	NA	744	NA	0	NA	744	NA	0	NA	0
Total	NA	1,326	NA	0	NA	1,326	NA	0	NA	0
Sawn products										
Softwood	9,877	8,100	0	0	9,877	8,100	0	0	0	0
Hardwood	369	2,949	0	0	369	2,949	0	0	0	0
Total	10,246	11,049	0	0	10,246	11,049	0	0	0	0
Fuel										
Softwood	80,678	79,363	29,767	34,832	3,375	5,757	43,735	33,469	3,801	5,305
Hardwood	52,778	49,158	22,673	23,307	8,133	6,415	21,492	18,919	480	517
Total	133,456	128,521	52,440	58,139	11,508	12,172	65,227	52,388	4,281	5,822
Miscellaneous										
Softwood	23,618	28,727	11,732	9,277	443		7,256	9,957	4,187	9,117
Hardwood	10,610	8,040	5,608	4,476	232	142	4,090	3,188	680	234
Total	34,228	36,767	17,340	13,753	675	518	11,346	13,145	4,867	9,351
Not used										
Softwood	3,843	2,915	1,499	1,365	930	578	1,346	971	68	1
Hardwood	3,316	2,426	1,420	1,010	681	662	1,180	754	35	0
Total	7,159	5,341	2,919	2,375	1,611	1,240	2,526	1,725	103	1
All products										
Softwood	213,597	202,310	42,998	45,474	97,318	89,052	56,466	49,500	16,755	18,284
Hardwood	104,106	92,990	29,731	28,793	44,983	38,908	27,945	24,229	1,441	1,060
Total	317,703	295,300	72,735	74,267	142,361	127,960	84,411	73,729	18,196	19,344

NA = Not applicable.

<sup>a</sup>Volume included with miscellaneous prior to 1990.

Table 14--Output of industrial roundwood products, by product and species group, Southern Coastal Plain of North Carolina, 1987 and 1990

Product and species group	Year		Change
	1987	1990	
	Thousand cubic feet		Percent
Saw logs			
Softwood	59,490	64,756	+8.9
Hardwood	16,187	12,784	-21.0
Total	75,677	77,540	+2.5
Veneer logs			
Softwood	28,922	25,836	-10.7
Hardwood	5,070	8,473	+67.1
Total	33,992	34,309	+ .9
<b>Pulpwood<sup>a</sup></b>			
Softwood	71,839	65,370	-9.0
Hardwood	45,306	38,889	-14.2
Total	117,145	104,259	-11.0
Composite panels <sup>b</sup>			
Softwood	NA	5,202	NA
Hardwood	NA	2,162	NA
Total	NA	7,364	NA
Other industrial			
Softwood	4,635	1,531	-67.0
Hardwood	4,098	0	-100.0
Total	8,733	1,531	-82.5
All industrial			
Softwood	164,886	162,695	-1.3
Hardwood	70,661	62,308	-11.8
Total	235,547	225,003	-4.5

NA = Not applicable.

<sup>a</sup> Includes roundwood that was delivered to non-pulpmills and then chipped and sold to pulpmills (7,044,000 cubic feet in 1987 and 4,987,000 cubic feet in 1990).

<sup>b</sup> Volume included with other industrial prior to 1990.

Table 15--Output of industrial roundwood products, by product and species group, Northern Coastal Plain of North Carolina, 1987 and 1990

Product and species group	Year		Change
	1987	1990	
	Thousand cubic feet		Percent
Saw logs			
Softwood	66,342	73,612	+11.0
Hardwood	20,409	19,342	-5.2
Total	86,751	92,954	+7.2
Veneer logs			
Softwood	16,631	15,064	-9.4
Hardwood	6,884	7,590	+10.3
Total	23,515	22,654	-3.7
<b>Pulpwood<sup>a</sup></b>			
Softwood	78,476	82,309	+4.9
Hardwood	45,927	50,017	+8.9
Total	124,403	132,326	+6.4
Composite panels <sup>b</sup>			
Softwood	NA	2,883	NA
Hardwood	NA	5,081	NA
Total	NA	7,964	NA
Other industrial			
Softwood	3,137	115	-96.3
Hardwood	4,315	0	-100.0
Total	7,452	115	-98.5
All industrial			
Softwood	164,586	173,983	+5.7
Hardwood	77,535	82,030	+5.8
Total	242,121	256,013	+5.7

NA = Not applicable.

<sup>a</sup>Includes roundwood that was delivered to non-pulpmills and then chipped and sold to pulpmills (7,181,000 cubic feet in 1987 and 2,965,000 cubic feet in 1990).

<sup>b</sup>Volume included with other industrial prior to 1990.



Table 16--Output of industrial roundwood products, by product and species group, Piedmont of North Carolina, 1987 and 1990

Product and species group	Year		Change
	1987	1990	
	Thousand cubic feet		Percent
Saw logs			
Softwood	73,078	71,416	-2.3
Hardwood	42,990	41,148	-4.3
Total	116,068	112,564	-3.0
Veneer logs			
Softwood	3,339	2,872	-14.0
Hardwood	4,526	6,338	+40.0
Total	7,865	9,210	+17.1
<b>Pulpwood<sup>a</sup></b>			
Softwood	32,753	34,184	+4.4
Hardwood	19,470	21,519	+10.5
Total	52,223	55,703	+6.7
Composite panels <sup>b</sup>			
Softwood	NA	8,726	NA
Hardwood	NA	8,584	NA
Total	NA	17,310	NA
Other industrial			
Softwood	5,174	382	-92.6
Hardwood	4,794	32	-99.3
Total	9,968	414	-95.8
All industrial			
Softwood	114,344	117,580	+2.8
Hardwood	71,780	77,621	+8.1
Total	186,124	195,201	+4.9

NA = Not applicable.

<sup>a</sup>**Includes** roundwood that was delivered to non-pulpmills and then chipped and sold to pulpmills (6,694,000 cubic feet in 1987 and 3,441,000 cubic feet in 1990).

<sup>b</sup>Volume included with other industrial prior to 1990.

Table 17--Output of industrial roundwood products, by product and species group, Mountains of North Carolina, 1987 and 1990

Product and species group	Year		Change
	1987	1990	
	<u>Thousand cubic feet</u>		<u>Percent</u>
Saw logs			
Softwood	16,809	13,470	-19.9
Hardwood	35,796	30,166	-15.7
Total	52,605	43,636	-17.1
Veneer logs			
Softwood	0	328	+100.0
Hardwood	2,922	3,637	+24.5
Total	2,922	3,965	+35.7
<b>Pulpwood<sup>a</sup></b>			
Softwood	11,353	21,788	+91.9
Hardwood	15,412	16,659	+8.1
Total	26,765	38,447	+43.6
Composite <b>panels<sup>b</sup></b>			
Softwood	NA	1,348	NA
Hardwood	NA	535	NA
Total	NA	1,883	NA
Other industrial			
Softwood	510	19	-96.3
Hardwood	521	5	-99.0
Total	1,031	24	-97.7
All industrial			
Softwood	28,672	36,953	+28.9
Hardwood	54,651	51,002	-6.7
Total	83,323	87,955	+5.6

NA = Not applicable.

<sup>a</sup>Includes roundwood that was delivered to non-pulpmills and then chipped and sold to pulpmills (1,764,000 cubic feet in 1987 and 367,000 cubic feet in 1990).

<sup>b</sup>Volume included with other industrial prior to 1990.

**Davenport, Edgar L. 1992. Changes in North Carolina's industrial roundwood products output, 1987-1990. Resour. Bull. SE132. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station. 22 pp.**

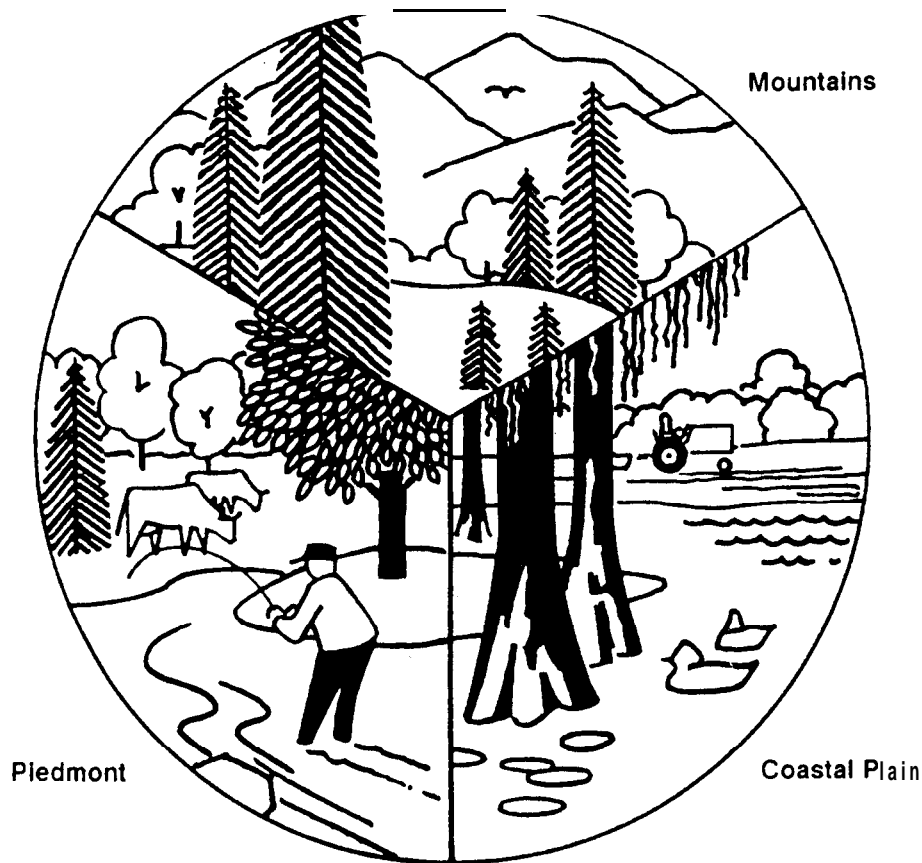
Over 764 million cubic feet of industrial roundwood products were harvested from North Carolina's forests during 1990, approximately 17 million cubic feet more than in 1987. Pulpwood accounted for 43 percent and saw logs 43 percent of the total roundwood production. Output of byproducts dropped from nearly 318 million cubic feet in 1987 to 295 million cubic feet in 1990. A little over 5 million cubic feet of residues, nearly 2 percent of the total produced, were not used. A total of 366 primary wood-using plants operated in the State during 1990. Mill receipts of more than 748 million cubic feet were 2 percent less than the State's production. The State was a net exporter of industrial roundwood.

**KEYWORDS:** Saw logs, pulpwood, veneer logs, mill residues.

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## Southeastern Forest Experiment Station

Established 1921

The Southeastern Forest Experiment Station, headquartered in Asheville, North Carolina, is one of the eight regional Experiment Stations, and the Forest Products Laboratory, that make up the Forest Service research organization.

### RESEARCH MISSION:

To acquire the knowledge, develop the technology, and disseminate the research findings required to manage the Southeast's forest resources in ways that satisfy demands of goods and services while maintaining a quality environment.

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